REMARKS/ARGUMENTS

This case has been carefully reviewed and analyzed in view of the Official Action dated 2 December 2004. Responsive to the rejections made in the Official Action, Claims 2 and 10 have been cancelled without prejudice or disclaimer and their limitations incorporated into Claim 1. Additionally, Claims 1, 3-9 and 11 have been amended so as to more clearly define the metes and bounds of the subject Application's inventive concept and thereby distinguish the present invention from the prior art cited. No new subject matter has been added.

The Applicants note with appreciation the Examiner's formal acceptance of the drawings as submitted.

It may be best to first summarize the particulars of the present Subject inventive method for recycling metals from swarf. The currently amended claims of the Subject Application methodology is directed to recycling metal from swarf, that is, the metal debris resulting from the machining of metal pieces in manufacturing processes and which is typically covered by an oily cutting fluid. The currently amended claims provide for swarf having an oily cutting fluid adherent to its surface; breaking up the particle size of the swarf so that it is in the 1 to 10 micron range; and then washing the swarf at least once in a washing tank using a washing solution having an alkaline pH ranging from 10.5 to 11.5. The inventive alkaline washing solution comprises (a) an aqueous alkaline non-ionic surfactant made of at least one polyethoxylated alkyl ether further comprising a hydrophobic ether moiety and a hydrophobic alkyl ether moiety; a

so-called "builder species" that may be any of the sodium salts of silicate, carbonate, or tripolyphosphate or combination thereof, along with water that further contains at least one polyethoxylated alkyl species. The important and distinguishing characteristics of this solution are that it has a specified alkaline pH, that it involves only ethers mixed with water and a sodium salt or salts as mentioned above, and that the hydrophilic and hydrophobic either species used have well-defined chemical structures as disclosed in the subject Application Specification. By separating the washed solids from the mixture of swarf and the alkaline washing solution, there remains a substantially particle-free washing solution which still contains some of the oily coating that had adhered to the swarf; the oil left in the solution after the solid has been washed and separated is basically decanted from the aqueous phase upon which it floats. What is left at this stage therefore is the substantially oil free and particle free washing solution which can be stored and reused numerous times. In other words, the present subject Application methodology provides for a fairly straight forward one step extraction of swarf metal(s) from the contaminating oily working solution by the use of an aqueous alkaline mixture of solvent and surfactant in water. The benefits for manufacturing involve both cost effective efficiencies in reducing the number of steps to accomplish such an extraction as well as further economizing by providing a washing solution that is meant to be recaptured for further swarf metal extractions.

In contradistinction, the Dankoff reference cited by the Examiner reveals a methodology for swarf metal extraction that involves breaking the agglomerated swarf to

some unspecified size that can be "effectively washed;" this de-agglomerated swarf is then mixed with a solvent with a surfactant additive; the solvent disclosed and claimed is preferably kerosene, while the surfactant is the alcohol nonylphenoxypoly (ethyleneoxy) ethanol. Once the filtrate has been removed during one or more iterations of the kerosene washing, the kerosene solvent must be removed by using an air tight chamber that is heated by an external heat source to sublimate the kerosene-lubricant mixture which requires temperatures in the range of 600 degrees to 1000 degrees C. The methodology taught by Dankoff seems silent as regards the pH environment for the reaction disclosed and claimed, and does not appear to use either the sodium salts or ethers as disclosed and claimed in the present subject Application system.

The Hatch reference cited by the Examiner is directed to a cleaning composition for metals in which all of the cleaning solutions described and/or claimed are alcohols rather than ethers. Furthermore, Hatch articulates a very strong preference for a highly acidic environment, although there is brief discussion of an embodiment in which Hatch uses an alkaline pH for the cleaning environment. The surfactants used by Hatch are as listed in paragraph 0041 and are alcohols for the most part; there is one sodium salt, Tergitol-O8 which is a sodium 2-ethyl hexyl sulfate. The Surfonic LF-17 that is described as an alkyl polyethoxylated ether with a propoxylate cap [page 3, [0041], is further described [page 4, 0041, first paragraph of the first column] as "... commercially available from Huntsman which is a linear polyethoxylated straight chain alcohol ..." (emphasis added). It seems that the preferred surfactant, which may be an ether in some

circumstances, is commercially available only as in ether, and thus is utilized for the preferred embodiment as an alcohol species.

The Examiner rejected Claims 1-11 under 35 U.S.C. § 112, second paragraph, for being indefinite. The Claims have been rewritten as reflected in their currently amended form so as to correct all instances of indefiniteness which the Examiner has kindly identified. Applicant is, therefore, of the belief that the currently amended Claims overcome the §112 basis for the Examiner's rejections.

The Examiner rejected all of the claims under 35 U.S.C. § 103(a) as being unpatentable over Dankoff (3,997,359) in view of Hatch (2004/0152614). The Examiner states that "*...Dankoff does not Characterize [sic] the washing solution as composed of an 'aqueous alkali non-ionic surfactant mainly involving polyethoxylated alkyl' ...*" The Examiner then states that "*Hatch et al discloses a cleaner composition...which is equivalent to the claimed surfactant in so far as it is understood.*" Applicant respectfully notes that Hatch's patent teaches an alcohol-based cleaning composition, "*...an ethoxylate of an alcohol having Formula I, R_1—OH...*" [Claims 1, 19, 27, 36, 45 53], which preferred cleaning solution is contemplated as having a pH between 2 and 9 (see [0039] and [0040]), in contradistinction to the present subject composition having a pH in the range of 10.5 –11.5.

Moreover, Hatch's method combines the cleaning solution with one of several surfactants, including the Antarox BL 330 — "*...a modified polyethoxylated straight chain alcohol...*" [0041 on page 4] — that is mentioned in the Official Action by the Examiner. Thus Hatch's surfactant(s) and cleaning solutions are all alcohols, unlike the hydrophilic and hydrophobic ether surfactants of the present subject invention; likewise, the 'builders' —— which as their context and function indicate are chemical enhancers of the surfactant's cleaning function — are any of three sodium salts: sodium silicate or carbonate or tripolyphosphate. Taken as a whole, neither of the two citations, whether considered individually or in combination, teaches or suggests the use of any chemical species except for alcohols. The present subject invention is distinguished from the cited references in that none of the chemical species used either as solvents or surfactants is an alcohol. Structurally the subject compositions diverge from the cited references' compositions. The alkaline environment of the Subject Application process reinforces the non-equivalence here of the ether species and the alcohols of the cited prior art.

Additionally, the process steps taught by Dankoff seem patentably different from the present Subject invention method. Dankoff teaches the steps of first grinding and screening the swarf to some undisclosed size, unlike the specified 1-10 micron size particles in the subject Application; then washing just with solvent to remove water, which mixture is then "removed." Once the solvent/water mixture is removed, a "lubricant removing solvent" is added to the swarf, followed by "*...heating the now*

washed swarf in a closed environment such that air is substantially eliminated to a temperature high enough to remove from the swarf as vapor residual solvent and remaining traces of lubricant..." [Claim 1, on page 5] This is substantially more complicated than the method of the present Subject Application, in which the solvent and surfactant are used together in aqueous combination at relatively modest temperatures (45° to 60° C) [= 113° F—140° F] to effect the desired cleaning of the swarf for subsequent reclamation of metals, as well as for multiple re-uses of the washing solution.

The Subject inventive method thus offers a commercially advantageous process for degreasing and drying swarf in preparation for recycling the swarf metals. There are fewer steps without the need either for Denkoff's high temperatures of 600° to 1000° F or for the concomitant special equipment necessary to perform the Denkoff method steps. These differences have substantial cost-saving and time-saving implications for industrial-scale swarf recycling, an important goal of the subject Application's invention.

The Applicants are of the belief therefore that the Examiner's § 103(a) rejection is not proper given the fact that the chemical species are structurally dissimilar and the method steps are substantially different. The currently amended Claims are therefore believed to overcome the Examiner's § 103(a) rejections.

It is now believed that the subject Patent Application has been placed in condition for allowance, and such action is respectfully requested.

Respectfully submitted,
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